

WE CLAIM:

1. A transducing head comprising:
a main pole formed at least in part of a first magnetic material;
at least one magnetic element spaced from the main pole, wherein the magnetic element provides a potential return path for a magnetic field produced by the main pole, and is formed at least in part of a second magnetic material having a magnetic property that reduces side writing at the magnetic element.
2. The transducing head of claim 1, wherein the first magnetic material has a first saturation flux density B_{s1} and the second magnetic material has a second saturation flux density B_{s2} , where B_{s2} is lower than B_{s1} by at least 0.5 Tesla.
3. The transducing head of claim 2, wherein the difference between the first saturation flux density B_{s1} and the second saturation flux density B_{s2} is greater than about one Tesla.
4. The transducing head of claim 2, wherein B_{s2} is in a range of about 0.1 Tesla to about one Tesla.
5. The transducing head of claim 2, wherein B_{s2} is in a range of about 0.3 Tesla to about 0.6 Tesla.
6. The transducing head of claim 2, wherein B_{s1} is greater than about 1.5 Tesla.
7. The transducing head of claim 2, wherein the second magnetic material is selected from a group consisting of NiFeCu alloys, NiFeP alloys, NiFeB alloys, NiFeO alloys, and NiFeS alloys.

8. The transducing head of claim 1, wherein the second magnetic material has a coercivity in a range of about 10 Oersteds to about 1000 Oersteds.
9. The transducing head of claim 8, wherein the second magnetic material has a permeability greater than 50.
10. The transducing head of claim 8, wherein the material has a hard axis anisotropy field in a range of about 10 Oersteds to about 1000 Oersteds.
11. The transducing head of claim 8, wherein the second magnetic material is an alloy selected from the group consisting of CoFeHf, FeAlO, CoFeB, CoZrNb, CoAlPtO, FeCoNi, FeCoZrO, FeSiNi, NiFeNb, FeSi, CoZrO, and FeCoSi.
12. A transducing head comprising:
 - a pair of magnetic poles separated by a gap for writing data to a magnetic medium; and
 - means forming at least a portion of one of the poles for reducing side writing at that pole.
13. The transducing head of claim 12, wherein the means is a first magnetic material having a first saturation flux density B_{s1} , wherein at least a portion of the other pole is formed of a second magnetic material having a second saturation flux density B_{s2} , where B_{s1} is lower than B_{s2} by at least 0.5 Tesla.
14. The transducing head of claim 13, wherein the difference between the second saturation flux density B_{s2} and the first saturation flux density B_{s1} is greater than about one Tesla.

15. The transducing head of claim 13, wherein B_{s1} is in a range of about 0.1 Tesla to about one Tesla.
16. The transducing of claim 13, wherein B_{s1} is in a range of about 0.3 Tesla to about 0.6 Tesla.
17. The transducing head of claim 13, wherein B_{s2} is greater than about 1.5 Tesla.
18. The transducing head of claim 13, wherein the first magnetic material is an alloy selected from a group consisting of NiFeCu alloys, NiFeP alloys, NiFeB alloys, NiFeO alloys, and NiFeS alloys.
19. The transducing head of claim 12, wherein the means is a magnetic material having a coercivity in a range of about 10 Oersteds to about 1000 Oersteds.
20. The transducing head of claim 13, wherein the magnetic material is an alloy selected from the group consisting of CoFeHf, FeAlO, CoFeB, CoZrNb, CoAlPtO, FeCoNi, FeCoZrO, FeSiNi, NiFeNb, FeSi, CoZrO, and FeCoSi.
21. A magnetic core of a perpendicular read/write head, comprising:
 - a main pole;
 - a return pole separated from the main pole by a write gap at an end adjacent to a magnetic medium; and
 - a magnetic back via connecting the main pole and the return pole at a point distal from the magnetic medium, wherein the magnetic core has at least a low moment portion formed from a low

magnetic moment material having B_s in a range of about 0.1 Tesla to about one Tesla.

22. The magnetic core of claim 21, the low moment portion includes at least a portion of the return pole, which portion is close to the end adjacent to the magnetic medium.

23. The magnetic core of claim 21 wherein the low magnetic moment material is selected from a group consisting of NiFeCu alloys, NiFeP alloys, NiFeB alloys, NiFeO alloys, and NiFeS alloys.

24. The magnetic core of claim 21 wherein the magnetic core has a high moment portion formed from a high magnetic moment material having a saturation flux density greater than about one Tesla.

25. The magnetic core of claim 24, wherein the high moment portion of the magnetic core includes at least a portion of the main pole, which portion is close to the end adjacent to the magnetic medium.

26. The magnetic core of claim 24, wherein the high magnetic moment material has a saturation flux density greater than about 1.5 Tesla.

27. The magnetic core of claim 21, wherein the low magnetic moment material has a saturation flux density in a range of about 0.3 Tesla to about 0.6 Tesla.

28. The magnetic core of claim 21, further comprising a magnetic yoke flanking a portion of the main pole, wherein the low moment portion of the magnetic core includes at least a portion of the yoke.

29. A method comprising:
forming a main pole at least in part with a first magnetic material;
forming a magnetic element at least in part with a second magnetic material having a magnetic property that reduces side writing at the magnetic element, wherein the magnetic element is spaced from the main pole and provides a potential return path for a magnetic field produced by the main pole.
30. The method of claim 29, wherein the first magnetic material has a first saturation flux density B_{s1} and the second magnetic material has a second saturation flux density B_{s2} , where B_{s2} is lower than B_{s1} by at least 0.5 Tesla.
31. The method of claim 29, wherein the second magnetic material has a coercivity in a range of about 10 Oersteds to about 1000 Oersteds.